



Pond Problems

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Typical problems

- Aquatic weed identification and control
 - <http://aquaplant.tamu.edu/plant-identification/>
- Low (no) water
- Fish stocking or restocking
- Grubs in fish
- Geese
- Beaver and muskrats
- Turtles

Benefits of aquatic vegetation

- Provide food and/or shelter for fish or other species
- Produce oxygen
- Improve water quality and clarity

Aquatic Weed Control

- Treatment recommended when aquatic weeds cover more than 25 percent of the pond's surface area.
- Types of control
 - physical
 - chemical
 - biological

Plant Identification: Aquatic Weeds

- Algae
- Floating plants
- Submergent plants
- Emergent plants

Planktonic algae:
essential, cause bloom,
shade pond bottom, but
can cause fish kills by
lowering O₂



Aquaplant



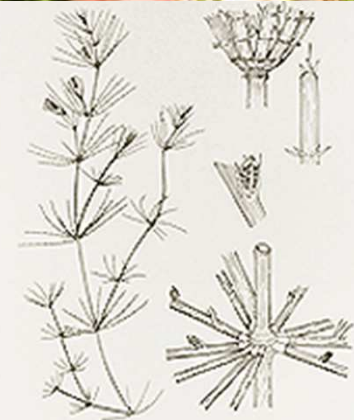
Aquaplant

Filamentous algae:
Single cells that form long chains and then float.
No known direct food value except for invertebrates.



Chara:

called muskgrass or skunkweed because of garlic-like odor, often confused with emerged flowering plants, crunchy texture.



Floating Plants

(free floating or rooted with floating leaves)

- Duckweed
- Watermeal
- Water lily
- American lotus



American lotus

Aquaplant



Water lily

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Duckweed or watermeal?



Submerged plants

(grow mainly below surface and have very soft stems)

- Pondweeds
- Elodea
- Watermilfoil
- Coontail
- Naiads
- Bladderwort

American pondweed



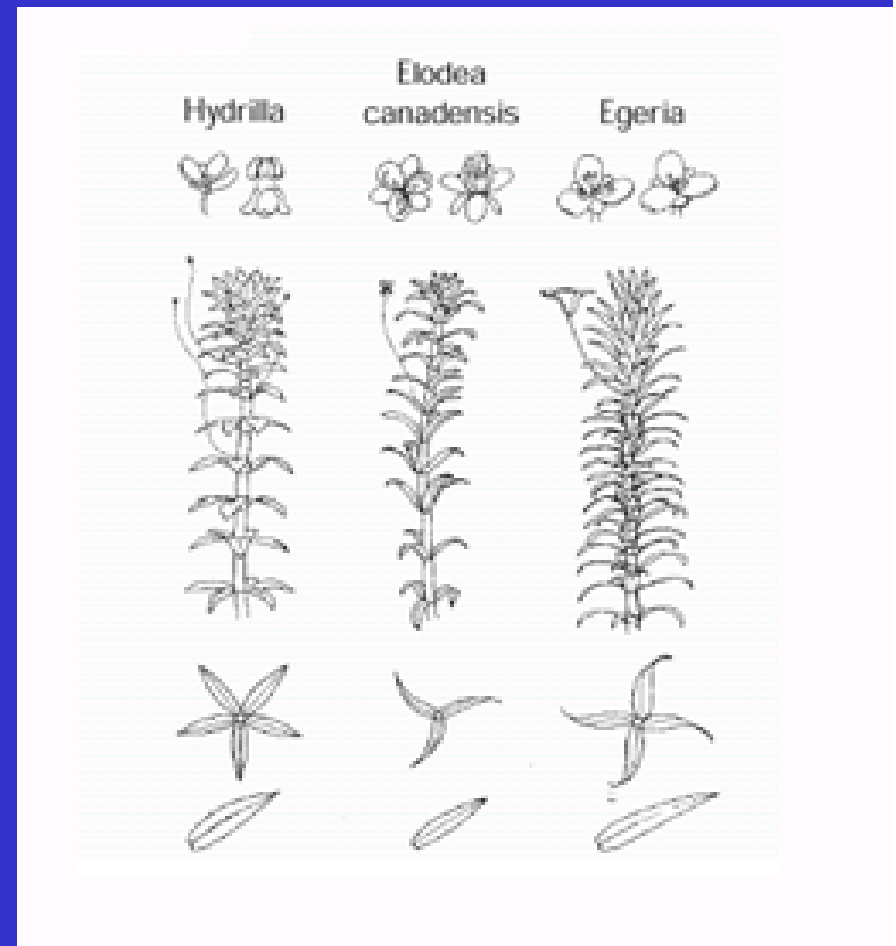
Sago pondweed



Elodea



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Water milfoil



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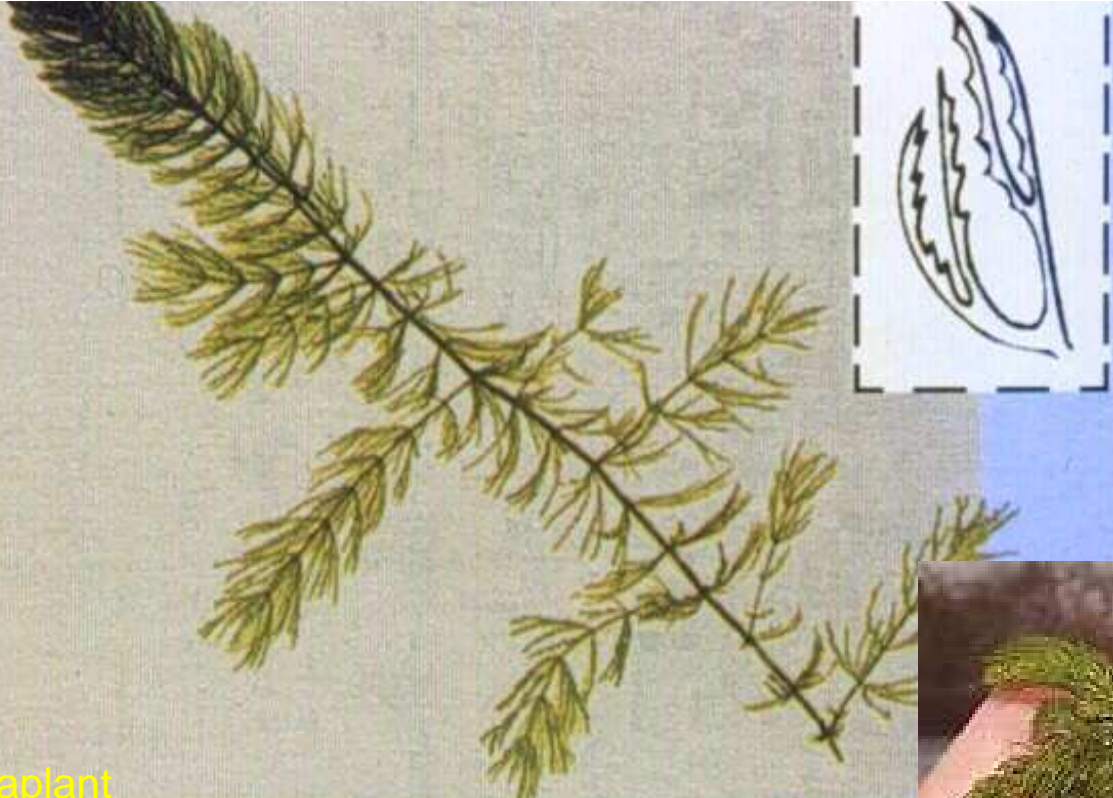
Southern naiad



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Coontail



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Emergent plants

(rooted in water but most of foliage above water)

- Arrowhead
- Cattail
- Water primrose





Water primrose



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State quarantine



Hydrilla



Purple loosestrife

Blue-green algae



Pictures courtesy of Lisa Davies, Junction City/Geary County Health Department Milford Lake 2011



Picture courtesy of KDHE - Bureau of Environmental Field Services, Veteran's Lake, Barton County, KS



Biological control

- Will fish control HABs?
 - Perhaps
 - Tilapia
 - Stocking rate 25-50/ac adults
 - Digestion efficiency ranged from 58.6 to 78.1% at water temperature of 77°F.
 - Ingestion rate increased with increasing fish weight and water temperature
 - Major problem is they die when water temperature is below 55°F
 - Grass carp?



Biological Control

- **Plant-eating fish.**
- **Introduced from Asia in 1963.**
- **Reaches 60 pounds.**
- **Triploid species available for stocking.**

Grass Carp as a Biological Control of Aquatic Weeds

- Can be very effective but they are not a cure-all.
- May result in turbid water.
- Overstocking can seriously effect sport fish populations.
- Cattails, spatterdock and filamentous algae are eaten last.
- Results are not guaranteed.

Grass Carp Guidelines

- **Stock only if pond surface is more than 20 percent covered in vegetation.**
- **Calculate pond size accurately.**
- **Total elimination of vegetation occurs at 30 fish (10-12 inches) per acre of vegetation.**
- **Vegetation control occurs at 15 fish (10-12 inches) per acre of vegetation.**

Chemical Control

You must calculate the area and volume of a body of water

Area = length X width

Surface area in acres = pond area in square feet/43,560

Volume = average length X average width X average depth

Acre feet = surface area (acres) X average depth

Online calculator

<http://www.pondcare.com/reference-center/pond-calculator/index.aspx>

Important Points to Remember

- Match aquatic weed with appropriate herbicide.
- Use only registered herbicides.
- FOLLOW LABEL INSTRUCTIONS.
- Treat evenly.
- Apply chemical early in the growing season..



Response of common aquatic weeds to herbicides

Aquatic group and weed	copper complexes	2, 4-D*	diquat*	endothall*	fluridone	glyphosate
Algae						
planktonic	E	P	P	P	P	P
filamentous	E	P	E	G (hydro)	P	P
chara	E	P	G	G (hydro)	P	P
nitella	E	P	G	G (hydro)	P	P
Floating Plants						
bladderwort	P	G (gran)	E		E	
duckweeds	P	G (LV)	G	P	E	
water hyacinth	P	E	E		P	G
watermeal	P	P	P-F		F-G	

Response of common aquatic weeds to herbicides

Aquatic group and weed	copper complexes	2, 4-D*	diquat*	endothall*	fluridone	glyphosate
Emergent Plants						
American lotus	P	E	P	P	F	G
arrowhead	P	E	G	G		E
cattails	P	G	G	P	F	E
water lily	P	E	P		E	E
sedges & rushes	P	F	F		P	G
smartweed	P	E	F		F	E
water primrose	P	E	F	P	F	E
willows	P	E	F		P	E
Submersed Plants						
broadleaf						
water milfoil	P		E	E	E	P
coontail	P	G	E	E	E	P
elodea	P		E	F	E	P
eurasian						
water milfoil	P	E	E	E	E	P
naiads	P	F	E	E	E	P
pondweeds	P	P	G	E	E	P

Approximate Costs

	copper complexes	2, 4-D*	diquat*	endothall*	fluridone	glyphosate
Approximate costs To apply/acre foot	\$8-16	\$112-225	\$170-340	\$48-430	\$63-280	\$150-225

*Livestock Drinking Restrictions

E = Excellent

G = Good Control

F = Fair Control

P = Poor Control

Labels change periodically.

Read and follow label instructions and observe water use restrictions.



R Burns



Not enough water

- Diversion ditch
- Increase size of watershed (move location)
- Stop leaks
- Rain dance



Rough fish

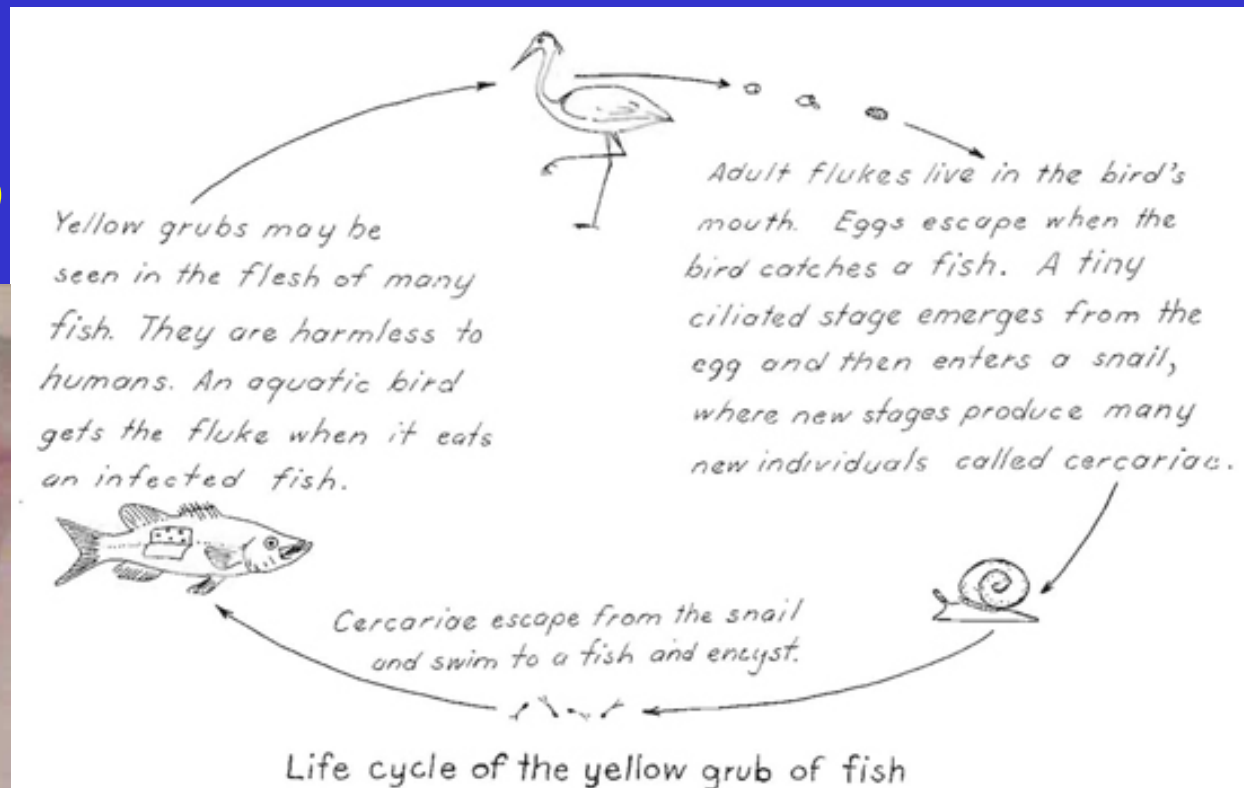
- May overpopulate and increase turbidity
- Common carp
- Bullheads

- Must eradicate fish
 - Drain
 - Toxicant



Grubs

- Some fish from farm ponds have parasites
- Back spot
- Yellow grub



Beaver

- Concerns or types of damage
 - Dam building
 - Bank burrowing
 - Tree cutting
 - Flooding
- Identifying damage is not difficult



Beaver

- Control options
 - Exclusion
 - Cultural
 - Frightening
 - Toxicants
 - Trapping
 - Shooting



Muskrats

- Burrowing is the main type of damage



Muskrats

- Control options
 - Riprap with rock
 - Drawdown and fill burrows over winter
 - Eliminate aquatic vegetation
 - Trapping
 - Shooting



Pond Boss

Waterfowl or waterbirds

- Types of damage
 - Excess nutrients
 - Algae growth
 - Pathogens
 - Salmonella
 - E. coli
 - Listeria
 - Chlamydia
 - Giardia
 - Cryptosporidium
 - Grubs in fish



Waterfowl

- Control options
 - Exclusion
 - Netting
 - Fencing
 - Wires
 - Frightening
 - Pyrotechnics
 - Dogs
 - Laser beams
 - Propane cannon
 - Hunting



Crawfish

- Types of damage
 - Erosion
 - Turf damage
 - Turbidity
 - Leaks in dikes



MDOC

Crawfish

- Control options
 - Not insecticides
 - Biological
 - Stabilize water levels
 - Traps



Turtles

- Primarily scavengers
- Types of damage
 - Seldom bite people
 - May kill ducklings
 - Eat fish on stringers



JHS

Turtles

- Control options
 - Keep levees mowed short
 - Routinely drain ponds
 - Trapping
 - Fishing



Livestock



Wildlife damage to dams is miniscule compared to livestock damage

Questions?

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